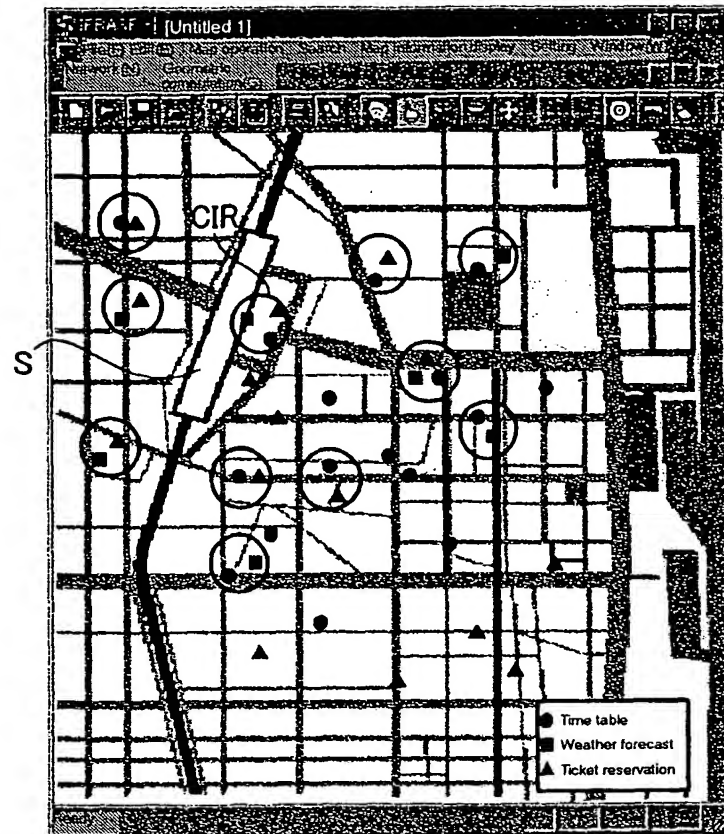


[Document type] Drawing

[Figure 1]

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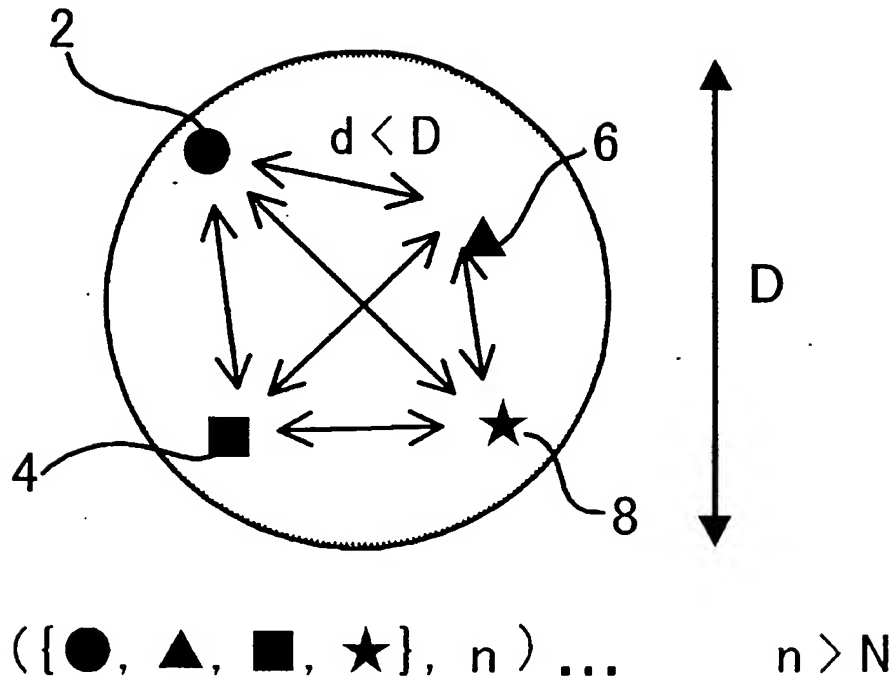
[Figure 2]

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Record number	Transaction ID	Position	Service name	Number of transmitted packets	...
1	ab12ef	(x ₁ ,y ₁)	Weather forecast	2	...
2	gh34lm	(x ₂ ,y ₂)	Time table	1	...
3	no56rs	(x ₃ ,y ₃)	Ticket reservation	4	...
4	tu78xy	(x ₄ ,y ₄)	Time table	1	...

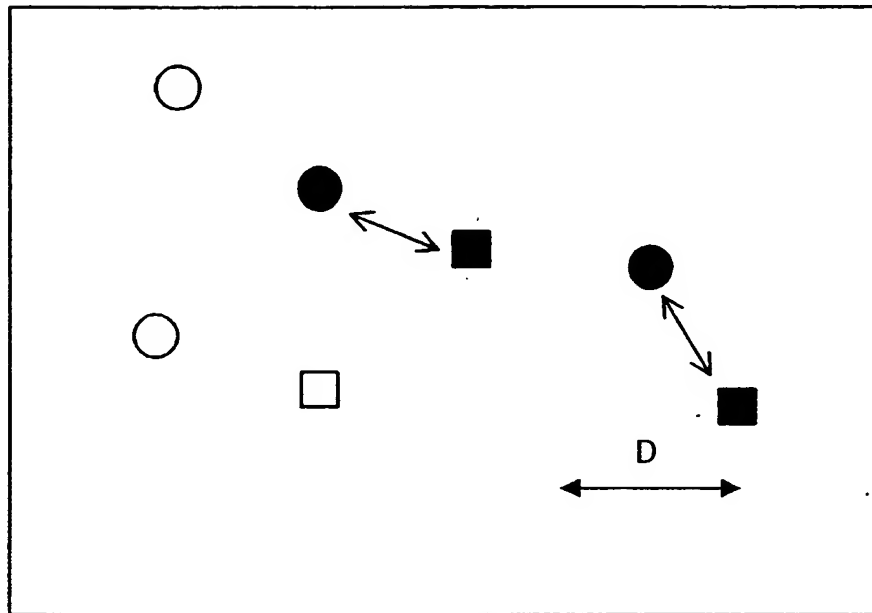
[Figure 3]

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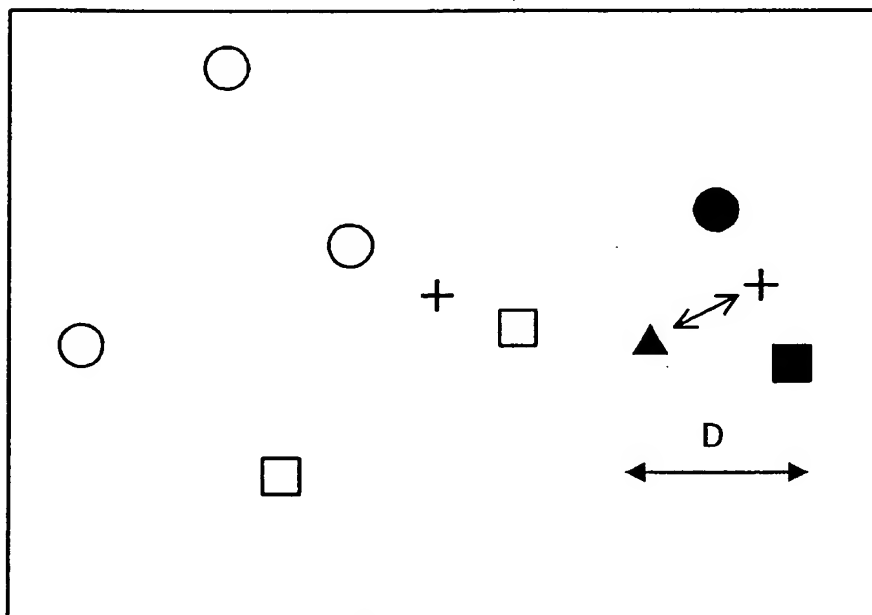


[Figure 4]

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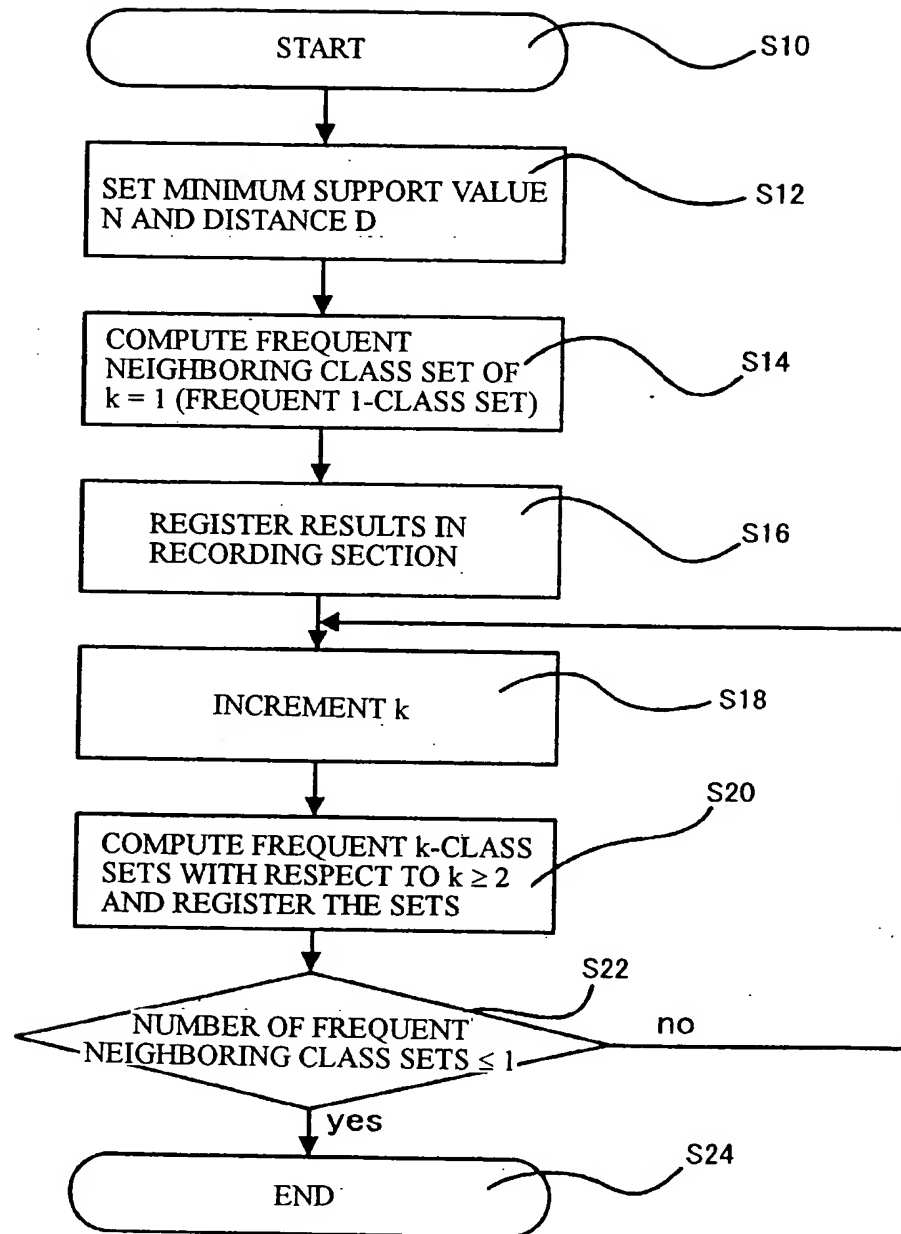
(a)



(b)

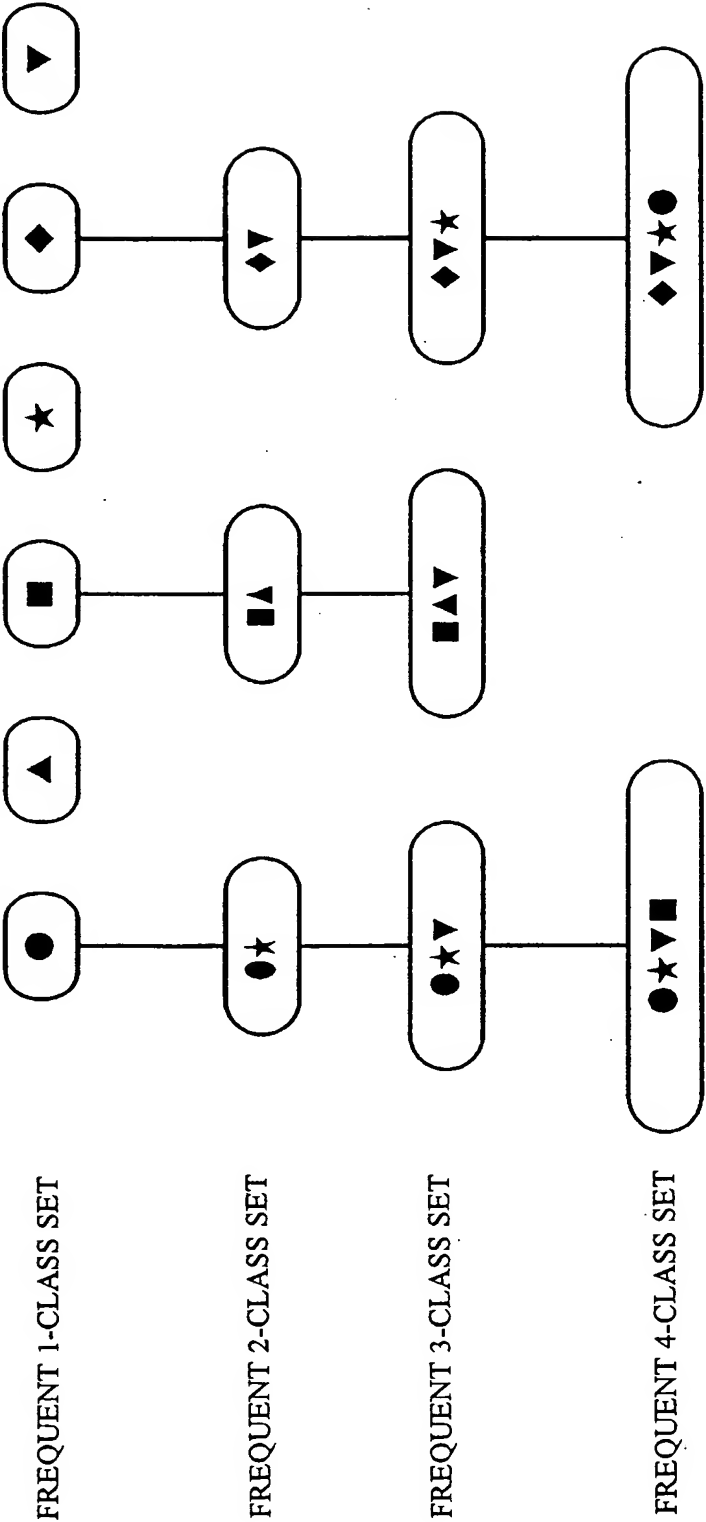
[Figure 5]

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[Figure 6]

(6/27)



[Figure 7]

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For (i=1; i≤m; i++)

/ Compute centroids of instances in proximity to frequent k-class set $C_k[i] \in S_k$

Obtain set G_i of centroids of instances /

/ Form voronoi diagram of G_i /

For j=i+1; i≤m; j++

/ Set $C_k[i] \in S_k$ as another neighboring k-class set /

/ Set $C_{k+1}[i,j]$ as neighboring class set formed of sum-set $C_k[i] \cup C_k[j]$ of two frequent neighboring class sets /

If total k number of class sets formed from $|C_{k+1}[i,j]| = k+1$ and $C_{k+1}[i,j]$ are frequent

$\text{sup}(C_{k+1}[i,j]) = 0$

Mark all instances of $C_k[i]$ as invalid

Set closest distance from all instances of $C_k[i]$ to $C_k[j]$ instance as ∞

For (with respect to each instance of $C_k[j]$)

Set p_i to point of $p_i \in C_k[j]$ and $p_i \in C_k[i]$

Search for nearest centroid $g_{\text{nearest}} \in G_i$ from p_i

Set found instance with respect to centroid as l_{nearest}

Check If $p_i \in l_{\text{nearest}}$ ($i=1, \dots, k$) is $\text{dist}(p_i, p_{ii}) < D$

/ If all points of l_{nearest} satisfy the above inequality?

If l_{nearest} is marked "Invalid"

Mark "Neighboring to p_i "

Increment $\text{sup}(C_{k+1}[i,j])$ by 1

Set nearest distance to $C_k[j]$ instance to $\text{dist}(g_{\text{nearest}}, p_i)$

If $\text{dist}(g_{\text{nearest}}, p_i)$ is smaller than nearest distance to present $C_k[j]$ instance

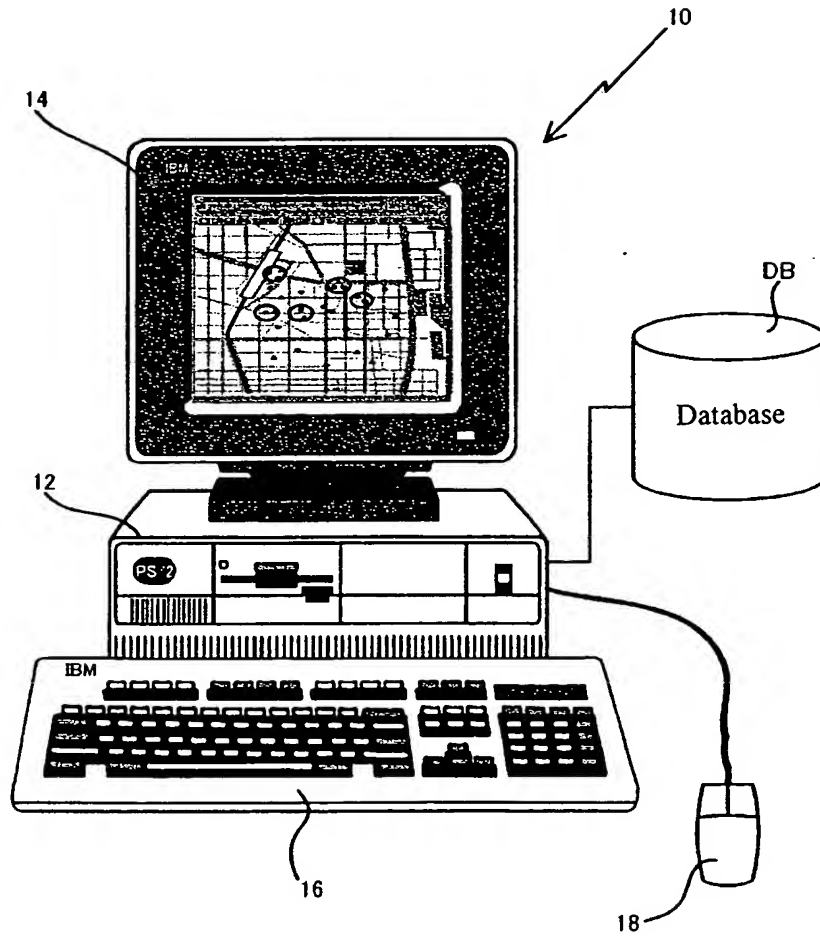
Update nearest distance and mark "Neighboring to p_i "

If $\text{sup}(C_{k+1}[i,j]) > N$

Form instance of $C_{k+1}[i,j]$ from instance of $C_k[i]$ marked "Neighboring" and add $C_{k+1}[i,j]$ to S_{k+1}

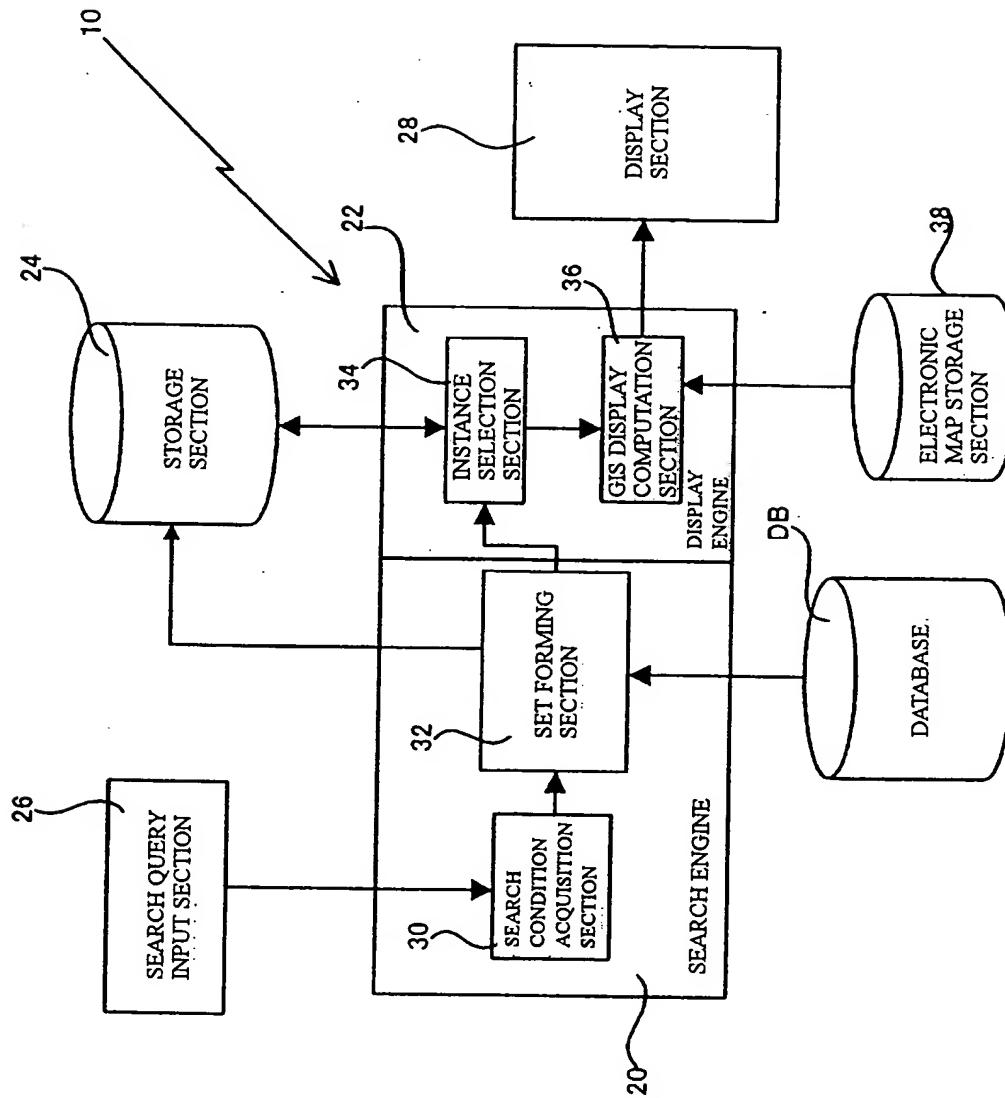
[Figure 8]

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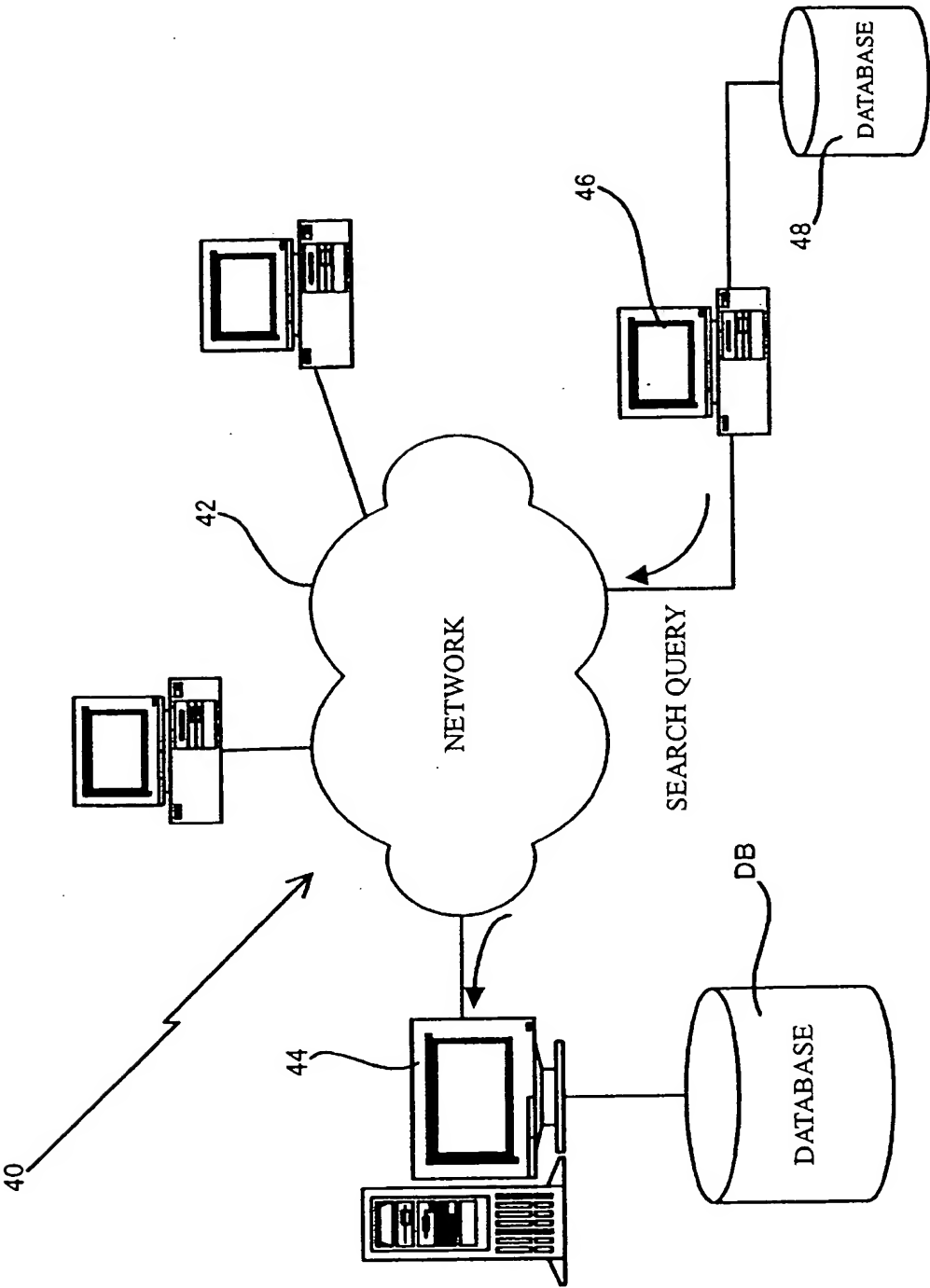
[Figure 9]

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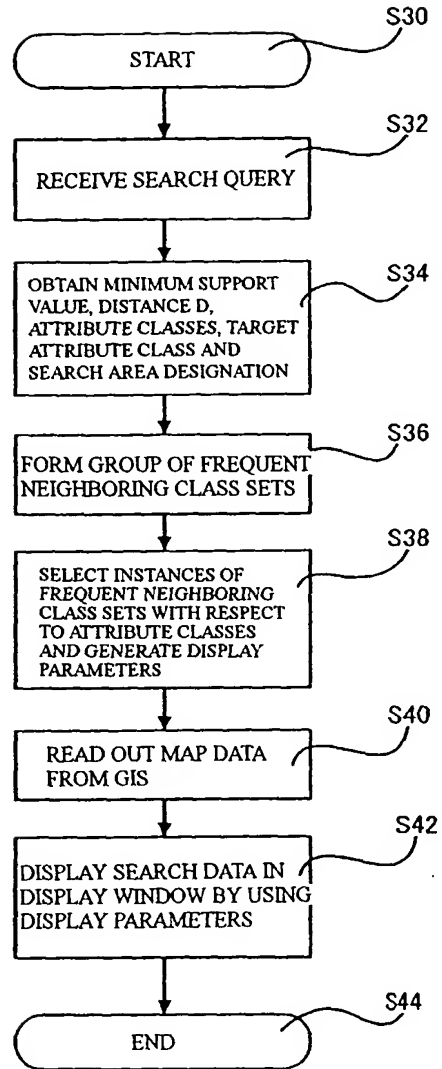
[Figure 10]

(10/27)



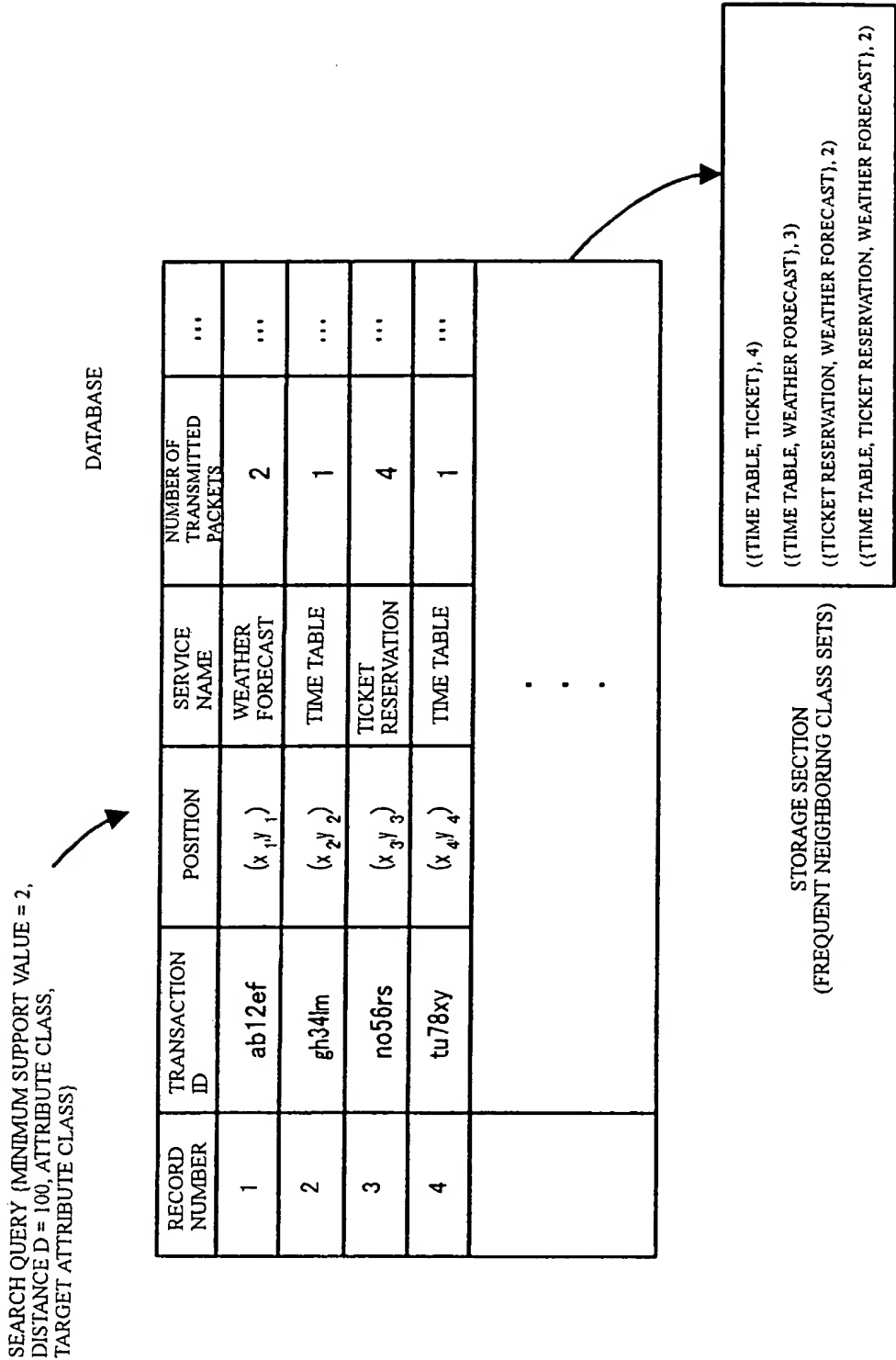
[Figure 11]

(11/27)

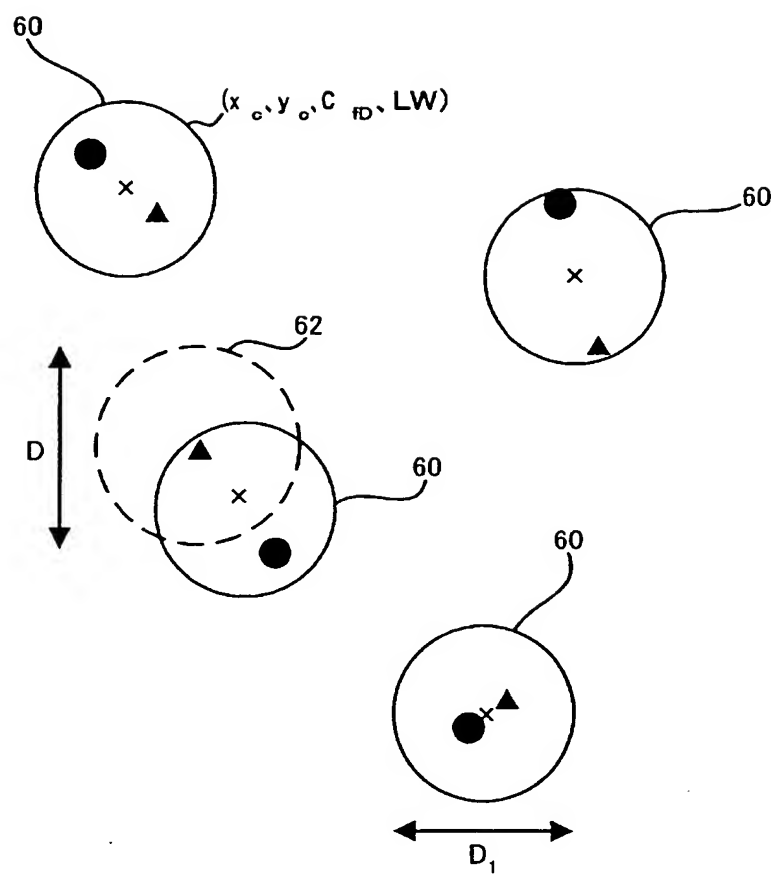


[Figure 12]

(12/27)

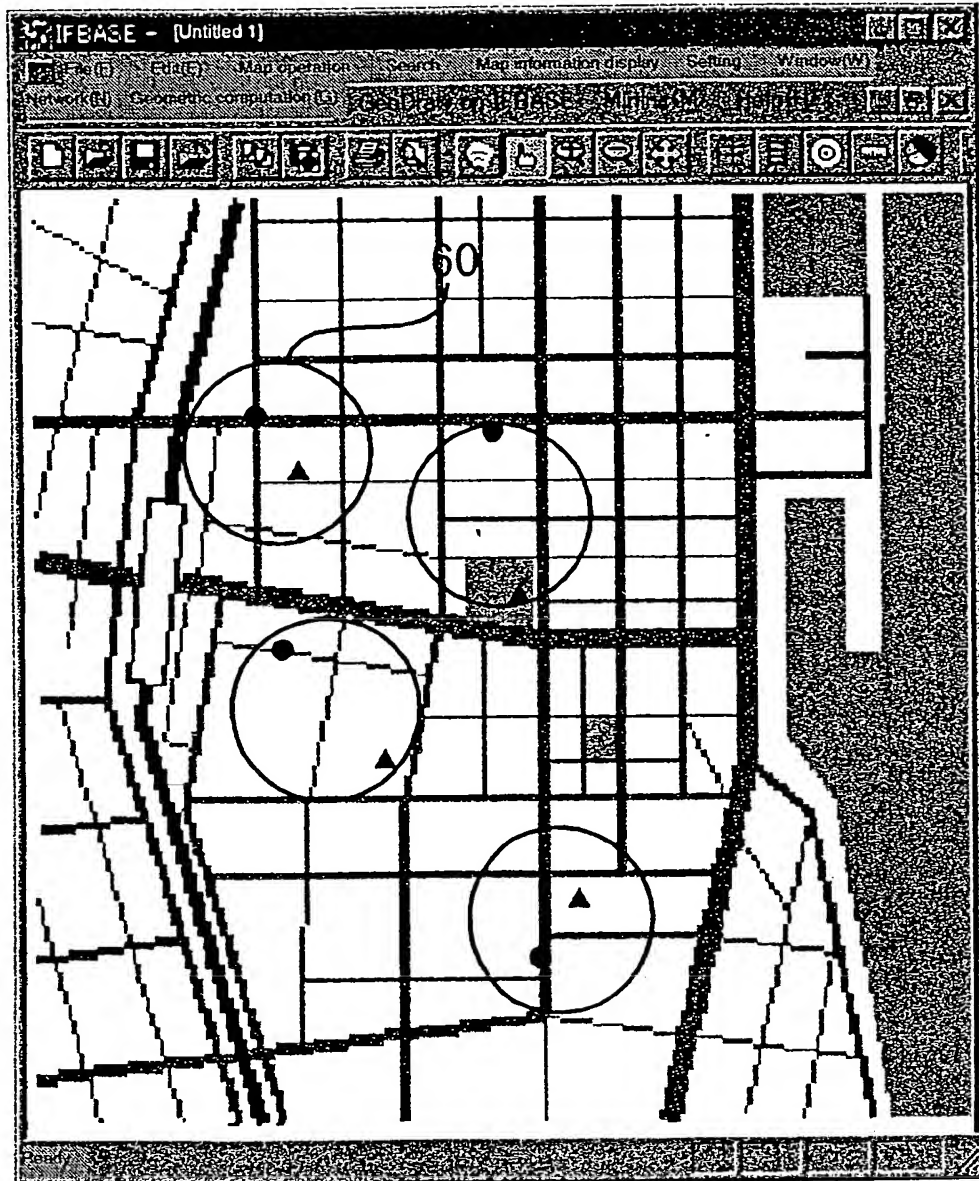


[Figure 13]



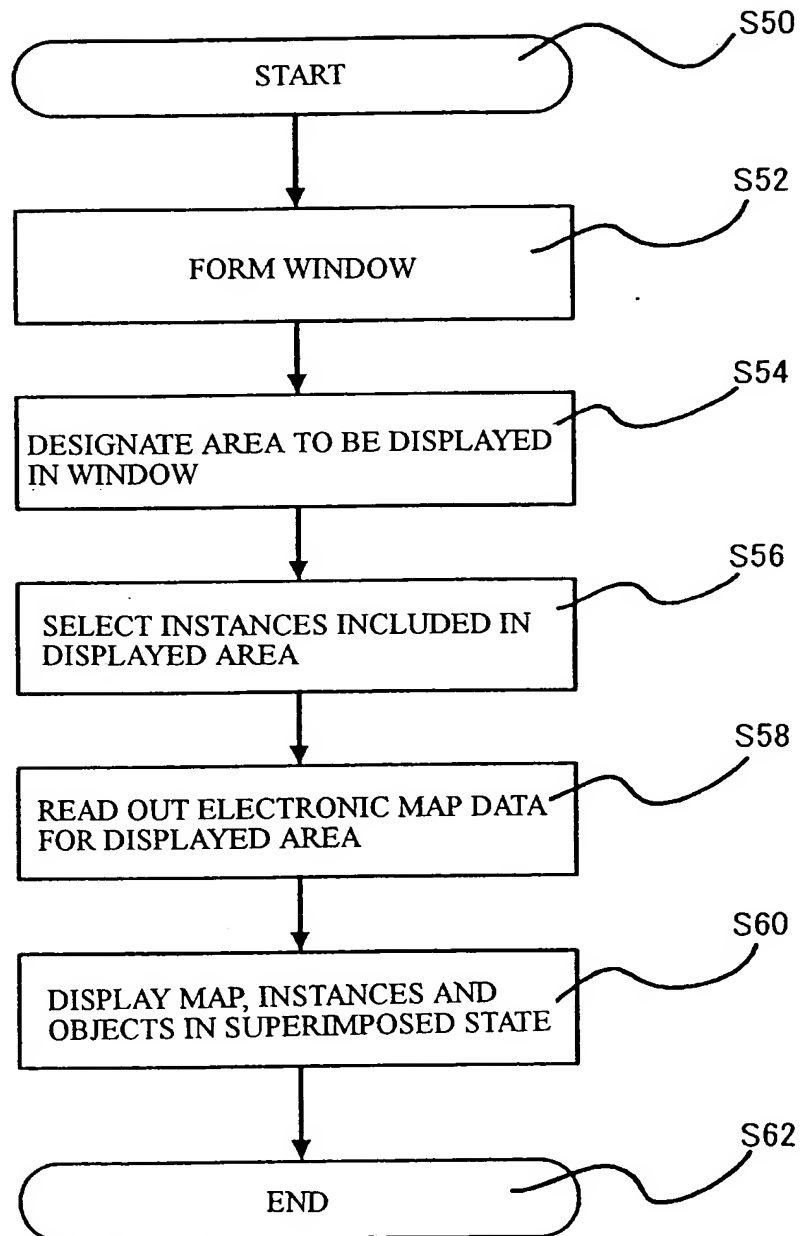
[Figure 14]

(14/27)



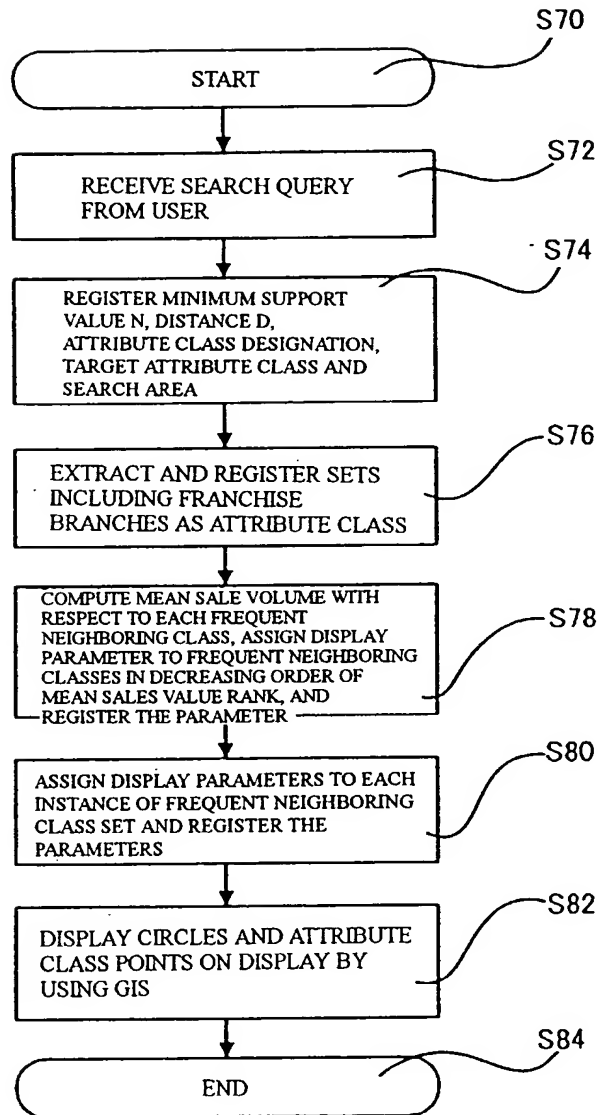
[Figure 15]

(15/27)



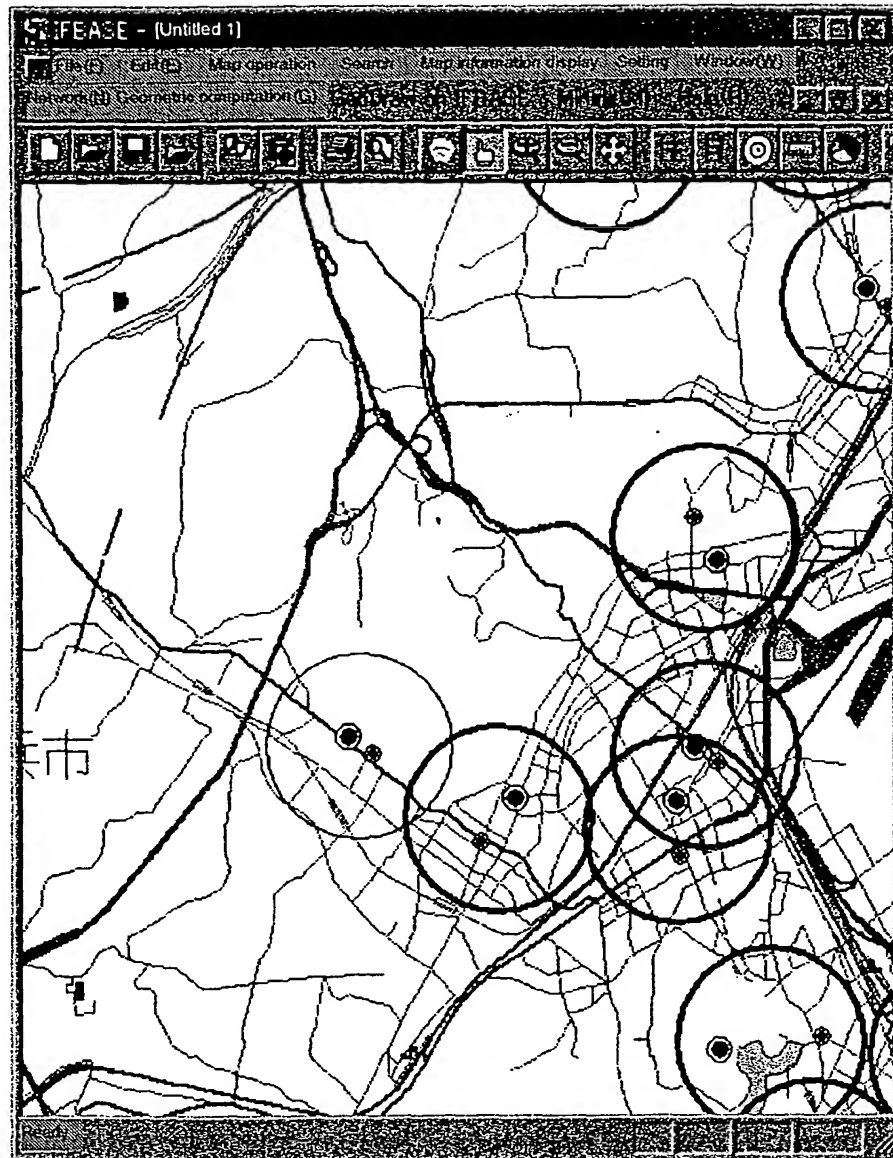
[Figure 16]

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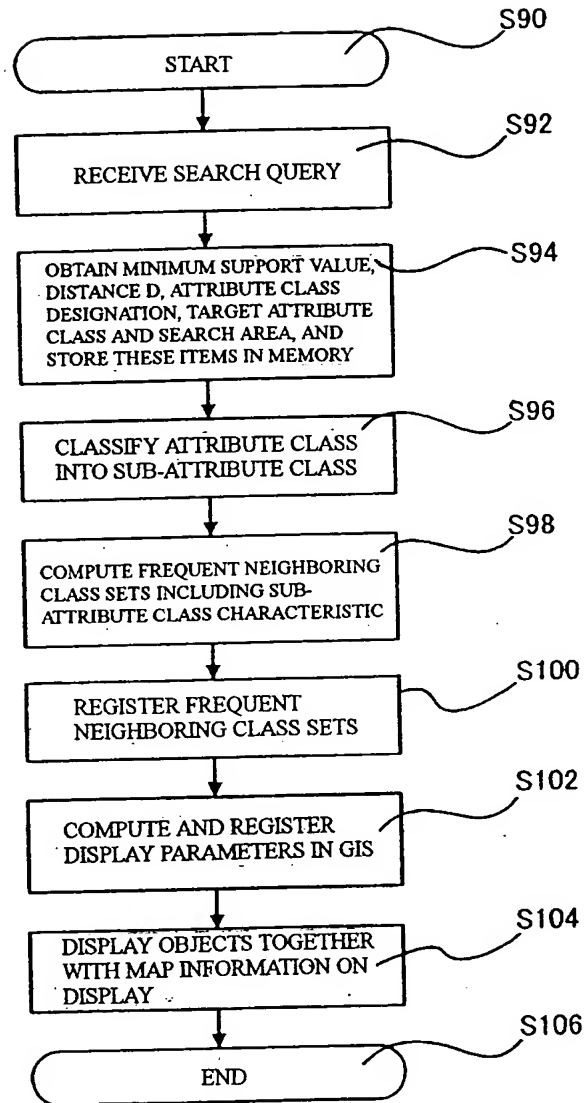
[Figure 17]

(17/27)



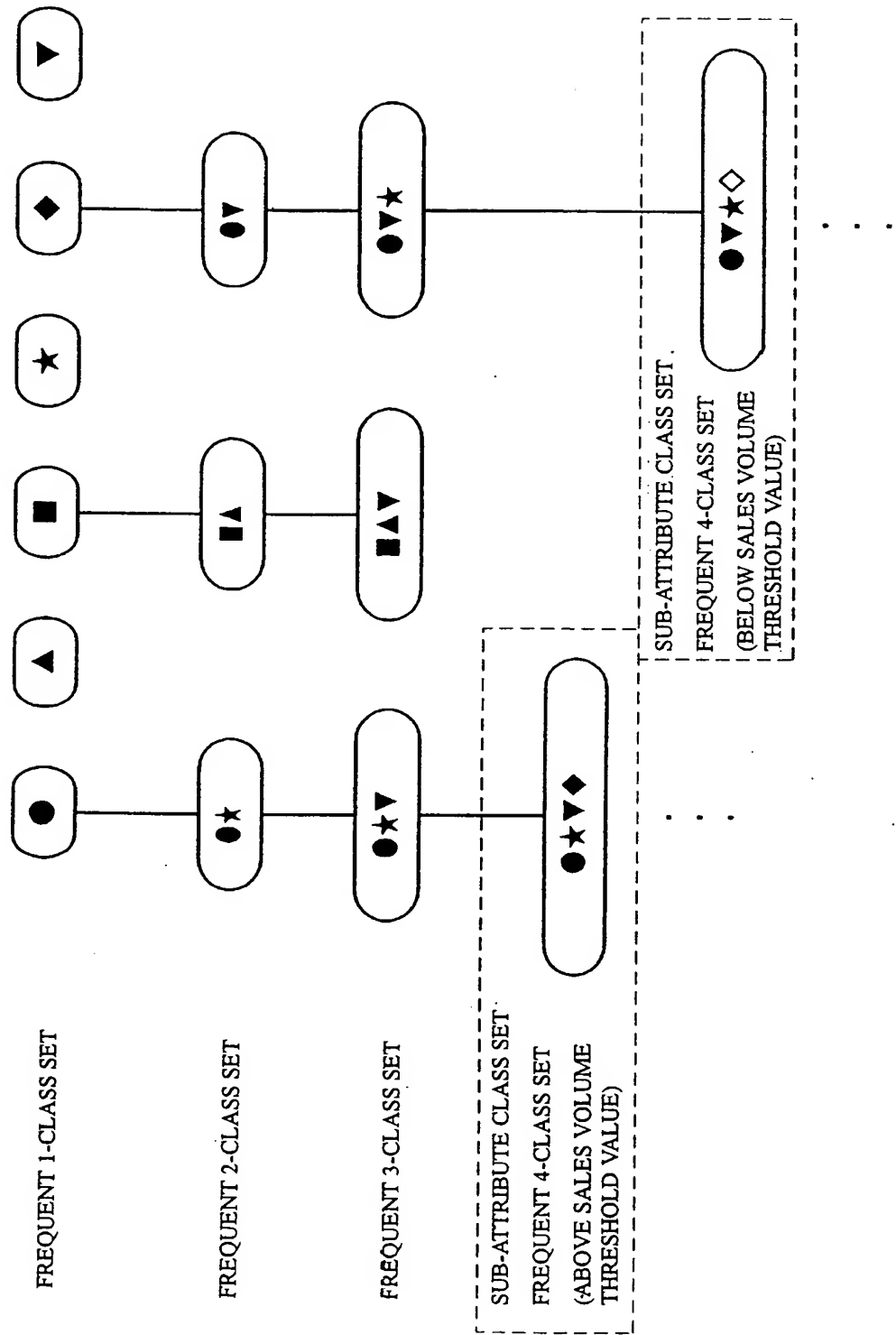
[Figure 18]

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[Figure 19]

(19/27)



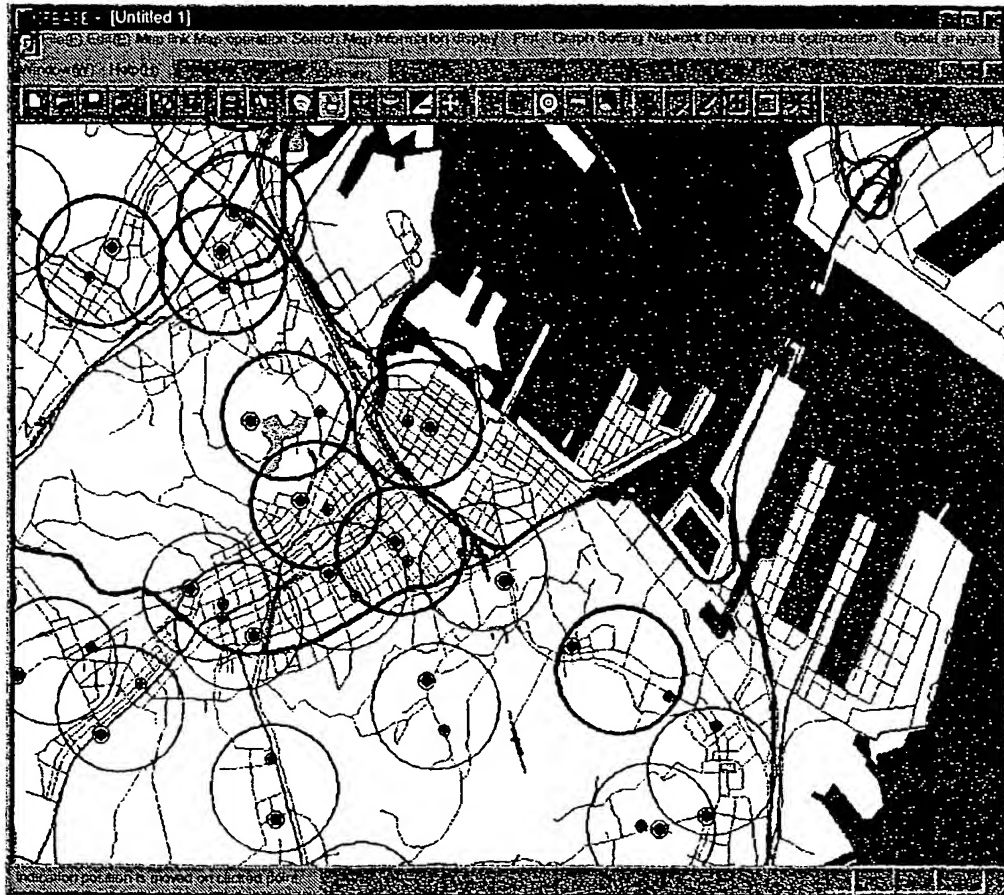
[Figure 20]

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	SUB-ATTRIBUTE CLASS		TOTAL NUMBER OF INSTANCES
	HIGH-SALES BRANCH	LOW-SALES BRANCH	
NUMBER OF INSTANCES OF FREQUENT NEIGHBORING CLASS SETS INCLUDING A	x	y	$x+y$
NUMBER OF INSTANCES OF FREQUENT NEIGHBORING CLASS SETS NOT INCLUDING A	$n1-x$	$n2-y$	$N-(x+y)$
TOTAL	$n1$	$n2$	N

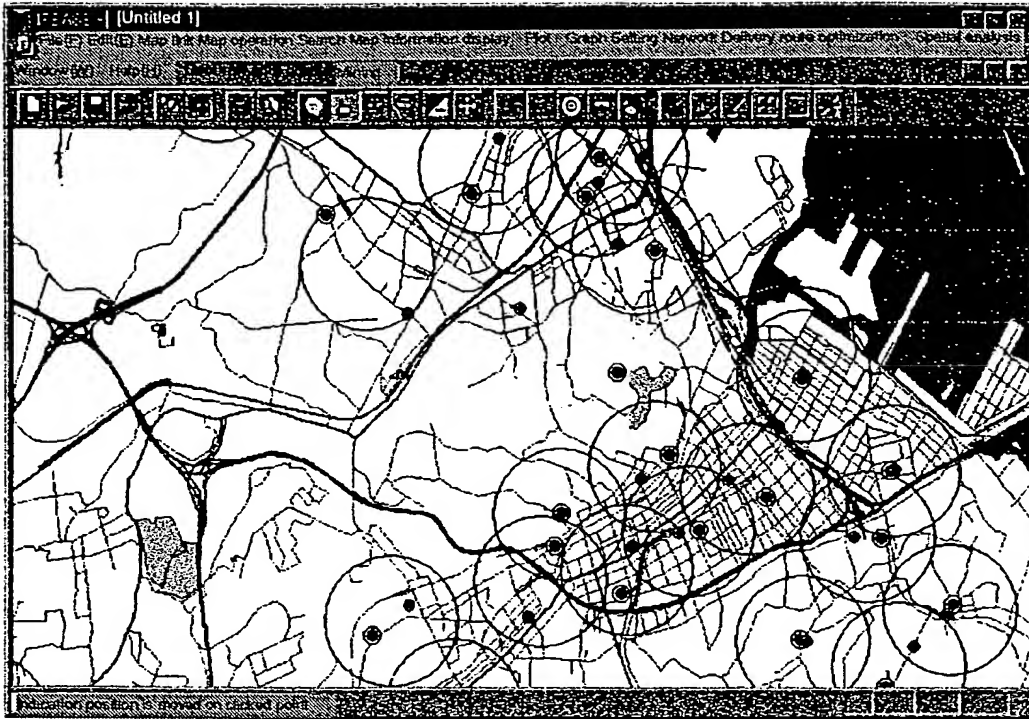
[Figure 21]

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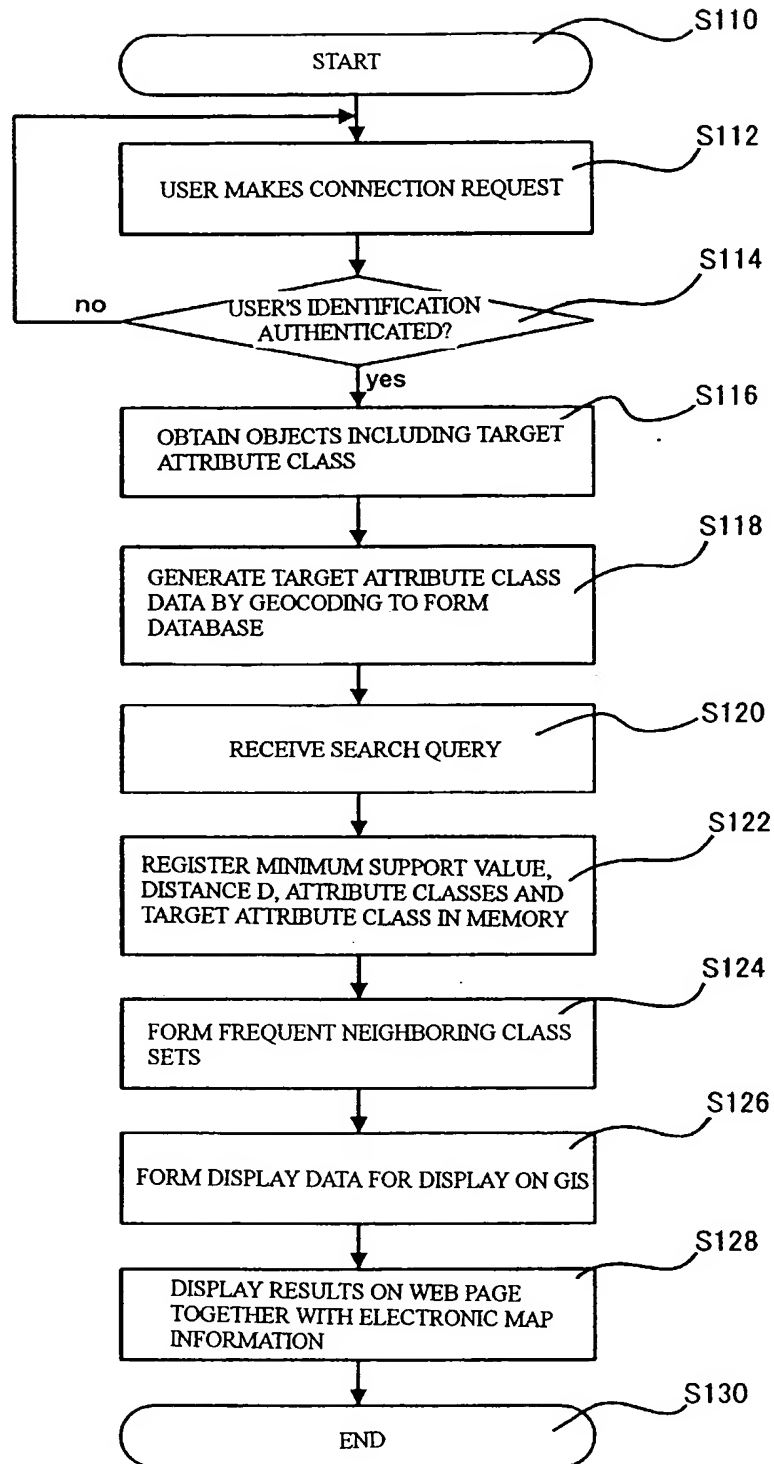
[Figure 22]

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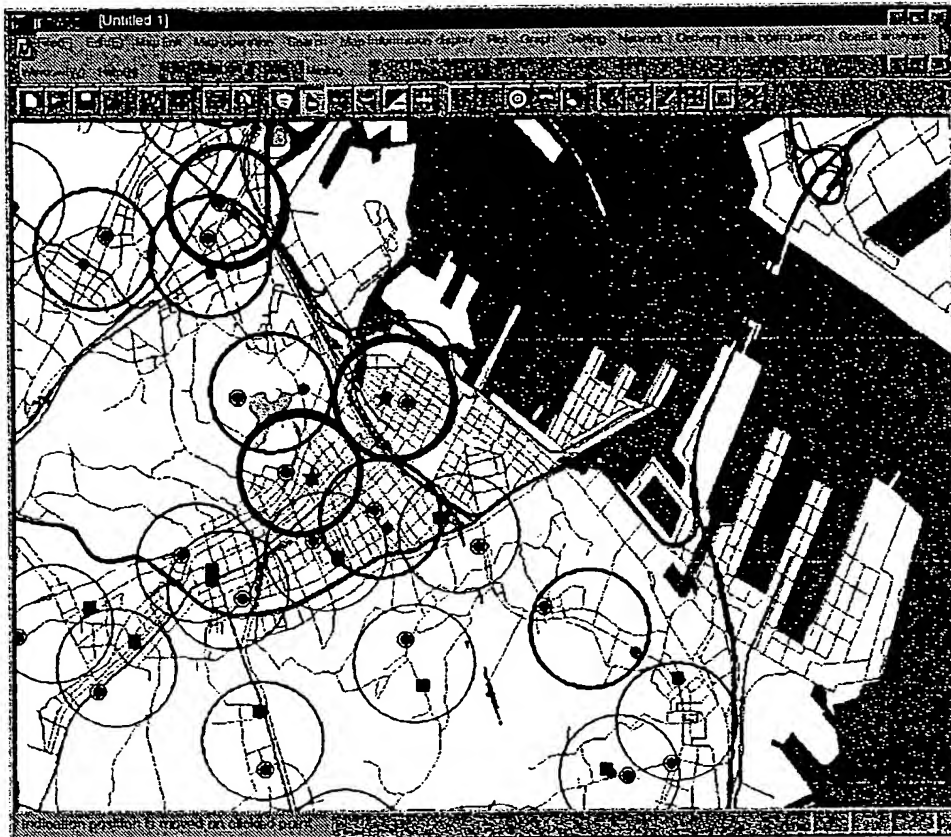
[Figure 23]

(23/27)



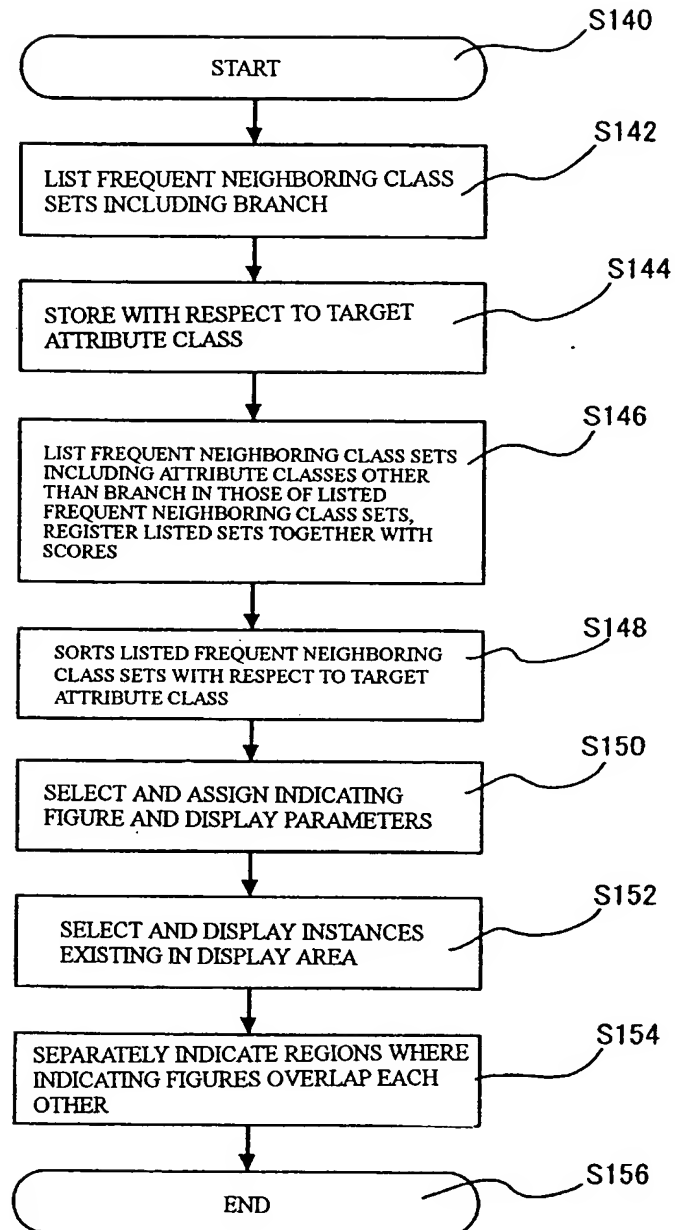
[Figure 24]

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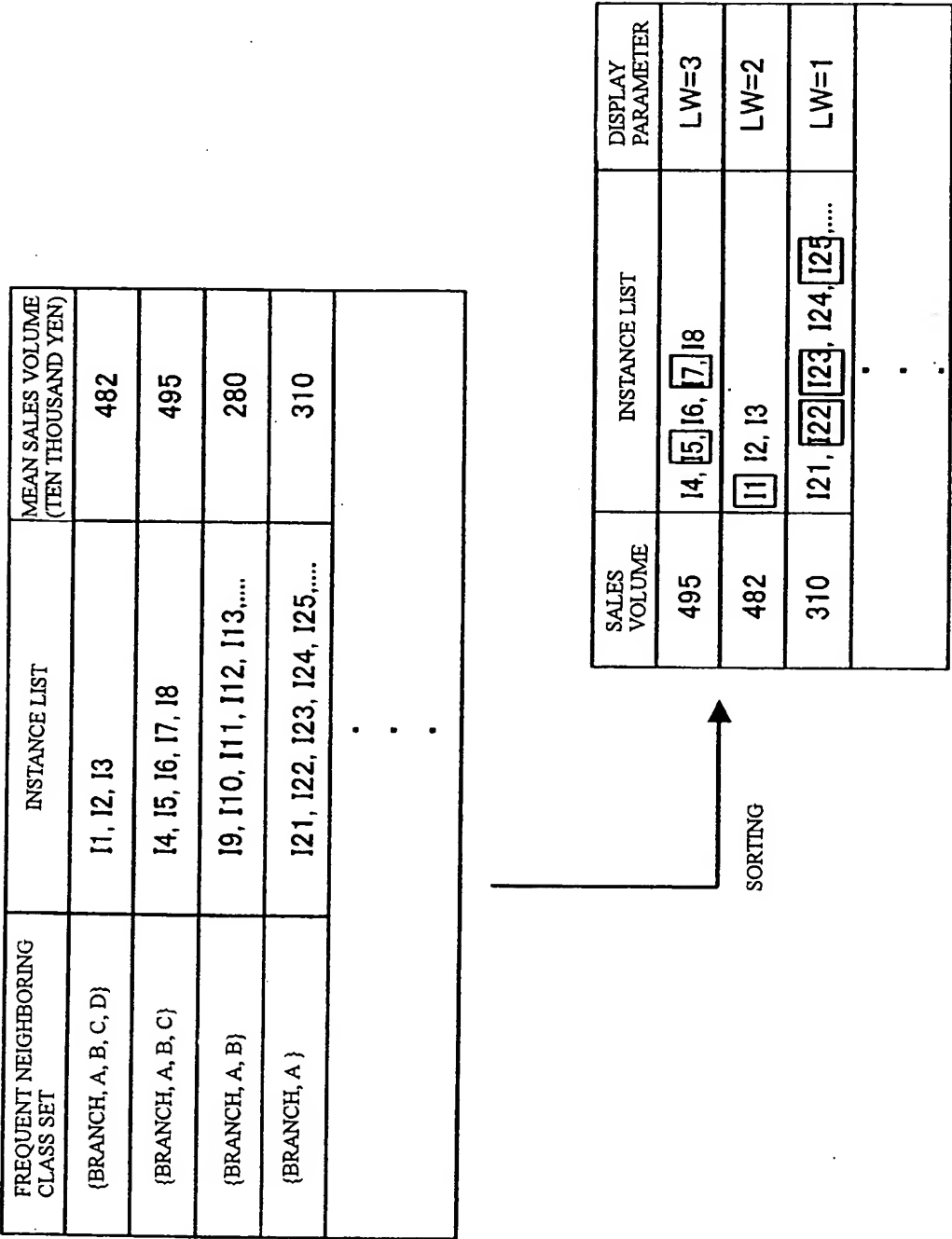
[Figure 25]

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[Figure 26]

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[Figure 27]

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